PTO/SB/21 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM

FEB 26 2007

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	24

Application Number	09/823,905
Filing Date	03/30/2001
First Named Inventor	Bruce Miller
Art Unit	2618
Examiner Name	Dean, Raymond S.
Attorney Docket Number	034300-101

ENCLOSURES ***(check all that apply)***

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment / Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) ____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☒ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) *(please identify below)*:

Postcard, Credit Card Payment Form (1 pg.)

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm	Thelen Reid Brown Raysman & Steiner LLP		
Signature			
Printed Name	Khaled Shami		
Date	02/20/2007	Reg. No.	38,745

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Signature	Julie Arango		
Typed or printed name	Julie Arango	Date	02/20/2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Bruce Miller et al.	CONFIRMATION NO.:	7577
SERIAL NO.:	09/823,905		
FILING DATE:	03/30/2001		
TITLE:	BOOSTER AUTO DETECT		
EXAMINER:	Dean, Raymond S.		
ART UNIT:	2618		

CERTIFICATE OF MAILING

I hereby certify that this paper is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450, on the date printed below:

Date: 02/20/2007 Name: Julie Arango
Julie Arango

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Dear Sir:

This paper is in support of a Notice to Appeal filed December 21, 2006, of the Office Action dated October 31, 2006, to the Board of Patent Appeals and Interferences.

02/27/2007 RMEBRAHT 00000003 09823905

01 FC:1402 500.00 OP

Table of Contents

Real Party in Interest

Sierra Wireless, Inc.

Related Appeals and Interferences

None.

Status of Claims

Claims 1, 3-8, 10-13, 15-17, 19, 21, 22, 24 and 25 have been finally rejected and are on appeal.

Claims 2, 9, 14, 18, 20 and 23 have been canceled.

Status of Amendments

No amendments after final rejection have been filed.

Summary of Claimed Subject Matter

The invention relates to a booster unit that attaches to a radio modem in order to increase the radio modem's power, and thus its range. Radio modems enable wireless transmission and reception of information. They are used with laptop computers, PDAs (personal digital assistants), and the like, and allow the host laptop or PDA to communicate wirelessly with other devices. The booster unit is placed between the radio modem and the antenna, and intercepts and boosts the RF signals passing between the radio modem and the antenna.

For proper operation, the radio modem must know that the booster unit is attached to it. Typically, this was accomplished by the user configuring the system so as to apprise the radio modem of the presence of the booster unit. A user who forgot to do this faced the possibility of improper operation or even component damage. Alternatively, a separate cable could be provided, which, when plugged in, would inform the radio modem of the presence of the booster unit. But this approach introduced the additional task of plugging in the separate cable, and the additional cost of the separate cable itself, and still left open the possibility of the user forgetting to plug the cable in and facing improper operation or component damage.

The inventive solution, discussed for example in paragraphs [0015]-[0016], addresses the above problems by using a circuit, distributed over one or both the radio modem and the booster unit, that provides an indication to the radio modem of the presence of the booster unit. In FIG. 1, that circuit is shown in the form of a pull-up circuit 30 and auto-detect logic 32 disposed in the radio modem 20, and a pull-down circuit 46 and auto-detect logic disposed in booster unit 34. The pull-up circuit places a voltage (DC offset) on the RF connection line which is used to convey the RF signal from radio 26 either directly to antenna 22 (FIG. 1) or indirectly, by way of RF connection line 38 and booster unit 34, to antenna 42 (FIG. 2). In the absence of booster unit 34, the DC offset is detected as a first value by auto-detect logic 32 in radio modem 20. However, due to pull-down circuit 46 in the booster unit 34, in the presence of the booster unit 34, the DC offset is detected as a second, different value by auto-detect logic 32. In this manner, the radio modem 34 is kept apprised of the presence or absence of the booster unit 34 and can consequently self-configure for proper operation.

In independent Claim 1, a system is recited that includes a radio modem unit (20'), an RF booster unit (34) "connectable to the radio modem unit through a single connection line [38] by way of which radio communication between the radio modem unit and the RF signal booster unit occurs," and "auto-detect logic [32] configured to detect a DC offset on said single connection, said DC offset being indicative of a connection of the radio modem unit to the RF signal booster unit." An explanation relating to Claim 1 can be found in paragraphs [0015]-[0016] and FIGS. 1, 2 and 5.

In independent Claim 8, a radio modem unit (20, 20') is recited. It includes a first DC offset circuit which comprises one of a pull-up (30, 30') or a pull-down (46) circuit, and an RF signal connector (24, 24', 36) operably connected to the radio, the connector being connectable to a RF antenna (22) or a booster unit (34) and including a single connection line (38) adapted to carry an RF signal and a DC offset. It also includes a detector unit (30, 30') adapted to detect the DC offset to determine whether the connector (24, 24', 36) is connected to a booster unit based on an interaction between the first DC offset circuit and a second DC offset circuit included in the booster unit and comprising the other of the pull-up or pull-down circuits. An explanation relating to Claim 8 can be found in paragraphs [0015]-[0016] and FIGS. 1, 2 and 5.

Claim 13 relates to a system that includes a radio modem unit (20, 20') including a first DC offset circuit which comprises one of a pull-up (30, 30') or a pull-down (46) circuit, and an RF signal booster unit (34) including a second DC offset circuit which comprises the other of the pull-up or pull-down circuits. The booster unit is connectable to the radio modem unit with a single coaxial connection line (38) adapted to transmit RF signals and a DC offset indicative of the presence of the booster unit based on an interaction between the first and second DC offset circuits. The baseband signals are transmitted to the RF signal booster unit (34) by way of the single coaxial connection line by the radio modem (20, 20') and are used by the booster unit to prepare for transmission. An explanation relating to Claim 13 can be found in paragraphs [0015]-[0016] and FIGS. 1, 2 and 5.

Claim 19 relates to an RF signal booster unit (34) adapted to amplify RF signals from a radio modem (20, 20') including a first DC offset circuit which comprises one of a pull-up (30, 30') or a pull-down (46) circuit. The booster unit includes a second DC offset circuit which comprises the other of the pull-up or pull-down circuits, and a switch (FIG. 4) that significantly attenuates the RF energy from the radio modem that is provided to a power amplifier (PA, FIG. 5) in the booster unit by way of a single connection line (38, 64) adapted to further carry a DC offset indicative, based on an interaction between the first and second DC offset circuits, of the presence of the booster unit until a valid power control message is received from the radio modem. The switch includes a pair of diodes (D1, D2) arranged back-to-back and disposed in the RF signal path, such that when the switch is in an ON position RF signals pass through the diodes from the radio modem to the booster unit, and when the switch is in an OFF position, RF signals are precluded by the diodes from effectively passing from the radio modem to the booster unit. An explanation relating to Claim 19 can be found in paragraphs [0015]-[0016] and [0019] and FIGS. 1, 2, 4 and 5.

Claim 22 relates to method of using a radio modem unit (20, 20') and an RF signal booster unit (34) that are connectable using a connector (24, 24', 36) establishing a connection line (38). According the method, in the radio modem unit, a DC offset on the connection line is detected in order to determine whether the booster unit is connected based on an interaction between a first DC offset circuit (30, 30', 32, 32') in the radio modem including one of a pull-up (30, 30') or a pull-down (46) circuit and a second DC offset circuit in the booster unit including the other of the pull-up or pull-down circuits. If the booster unit is connected, baseband signals are transmitted on the connection line from the radio modem to the booster unit to allow the booster unit to prepare for transmission. Thereafter, an RF signal is transmitted on the connection line from the radio modem to the booster unit. An explanation relating to Claim 22 can be found in paragraphs [0015]-[0016] and [0023] and FIGS. 1, 2, 5 and 7.

Grounds of Rejection to be Reviewed on Appeal

Whether Claim 1 is unpatentable under 35 U.S.C. 103(a)[1] over Hanawa et al. (U.S. Pat. No. 5,890,077; hereinafter, "Hanawa") in view of Cornforth et al. (U.S. Pat. No. 5,276,918; hereinafter, "Cornforth").

Whether Claim 8 is unpatentable under 35 U.S.C. 103(a)[2] over Hanawa in view of Cornforth and further in view of Pehrsson et al. (U.S. Pat. No. 6,615,059; hereinafter, "Pehrsson").

Whether Claims 13 and 22 are unpatentable under 35 U.S.C. 103(a) over Hanawa in view of Cornforth and further in view of Pehrsson.

Whether Claim 19 is unpatentable under 35 U.S.C. 103(a) over Barber (U.S. Pat. No. 6,230,031; hereinafter, "Barber") in view of Hanawa.

[1] The Final Office Action recites 35 U.S.C. 102(b), but this is clearly an error.
[2] The Final Office Action recites 35 U.S.C. 102(b), but this is clearly an error.

Argument

Claims 1 and 3-7

Claim 1, from which Claims 3-7 depend, was rejected for allegedly being unpatentable under 35 U.S.C. 103(a) over Hanawa in view of Cornforth.

Claim 1 recites a system that includes a radio modem unit (20'), an RF booster unit (34) "connectable to the radio modem unit through a single connection line by way of which radio communication between the radio modem unit and the RF signal booster unit occurs," and "auto-detect logic configured to detect a DC offset on said single connection, said DC offset being indicative of a connection of the radio modem unit to the RF signal booster unit." Claim 1 thus recites *a single connection line* between the radio modem and the booster. The single connection line serves two purposes: 1) It carries radio communication between the radio modem and the booster, and 2) it carries a detectable DC offset that indicates that the booster is connected to the radio modem. Such a single connection line is not disclosed in Hanawa. Hanawa discloses a connector (27, 57) and explains that communication between the telephone and booster is by way of the connector. Hanawa also explains that this communication occurs when a connection between the telephone and booster exists, and, in FIG. 7, shows an example of a connection detection circuit 96. However, none of these features read on claim 1, which, as stated above, recites a single connection line that serves the dual purpose of 1) carrying radio communication between a radio modem unit and a booster unit, and 2) carrying a detectable DC offset that indicates that the booster unit is connected to the radio modem. This is true even if, arguendo, the contention in the Office Action that the dedicated voltage shorting mechanism of detection circuit 96 of Hanawa is equivalent to the claimed DC offset is accepted. In Hanawa, the detection circuit 96, along with any discussion of detecting a connection of the booster to the telephone, are separate and distinct from the communication between the telephone and booster, *and there is never any teaching or suggestion of combining them over a single connection line in the manner of the present invention*. Even in the case where a single *connector*, as in the connectors 27 and 57 (to be distinguished from a single *connection line*) is shown in Hanawa, multiple connection lines are shown and these are in any case for communication purposes, not

for the purpose of carrying a DC offset in the manner claimed. In the case of connector 97, again multiple lines are shown, and these are both exclusively for grounding the transistor Q using shorting circuit 98 in connection detector 96.

The Office Action contends that the dedicated voltage shorting mechanism of detection circuit 96 of Hanawa is equivalent to the claimed DC offset. Appellants respectfully disagree. A DC offset in its ordinary and accustomed meaning is a deviation from some expected voltage value, and is not customarily used to characterized a short/open circuit. According to the Oxford English Dictionary, an offset in general is "A small fixed alteration or adjustment of some aspect of a system; *spec.* a small bias introduced to ensure correct operation of an electrical circuit. Also: a sustained deviation or discrepancy between the actual and predicted value of a variable; *spec.* a small deviation from a correct or normal voltage, current, etc." These definitions are inconsistent with the shorting mechanism provided in the detection circuit 96 of Hanawa. Therefore not only does Hanawa fail to teach or suggest a single connection line that serves the dual purposes of 1) carrying radio communication between a radio modem and a booster, and 2) carrying a detectable DC offset that indicates that the booster is connected to the radio modem, but Hanawa also fails to teach or suggest the use of a DC offset on a connection line altogether. These shortcomings of Hanawa are not remedied by Cornforth, in which connection line 25 for carrying RF and IF signals between a radio unit 1 and a booster 3 may also be, as explained in col. 4, ll. 35-40, used for DC transmission *in order to supply power to the hand-portable unit 1.* There is no teaching or suggestion in Cornforth of the use of a DC offset on the connection line, used in conjunction with auto-detect logic, to indicate a connection of a radio modem unit to a booster unit. Thus the combination of Hanawa and Cornforth, even if proper, would not result in or render obvious all the claimed features of Claim 1. For these reasons at least, Appellants respectfully request that the 35 U.S.C. § 103(a) rejection Claim 1, and Claims 3, 5, and 7 dependent therefrom, based on the combination of Hanawa and Cornforth, be overturned. Claims 2, 4 and 6 also depend from Claim 1 and are allowable for at least the same reasons.

Claims 8 and 10-12

Claim 8, from which Claims 8-12 depend, was rejected for allegedly being unpatentable under 35 U.S.C. 103(a) over Hanawa in view of Cornforth, and further in view of Pehrsson.

Claim 8 recites "a radio including a first DC offset circuit which comprises one of a pull-up or a pull-down circuit," "an RF signal connector ... adapted to carry an RF signal and a DC offset," and "a detector unit adapted to detect the DC offset to determine whether the connector is connected to a booster unit based on an interaction between the first DC offset circuit and a second DC offset circuit included in the booster unit and comprising the other of the pull-up or pull-down circuits." These features are also absent from Hanawa and Cornforth, as an extrapolation of the above discussion would clearly show. Specifically, Hanawa does not disclose or suggest an RF signal connector that is adapted to carry an RF signal and a DC offset. Hanawa uses separate mechanisms to transmit the RF signal between telephone 11 and booster 12 on the one hand, and to detect the presence of the booster 12 on the other. Further, Cornforth does not show any mechanisms for detecting the presence of booster unit 3, and while Cornforth discloses applying a DC voltage to the connector 25 that is used to transmit RF signals between the booster 3 and the portable unit 1, the DC voltage is for purposes of supplying additional power to the portable unit 1, not for indicating its presence. Pehrsson adds nothing to remedy this shortcoming. Thus the combination of Hanawa, Cornforth and Pehrsson, even if proper, would not result in or render obvious all the claimed features of claim 8. Therefore Claim 8, along with claims 10-12 dependent therefrom, is patentable over these references and the obviousness rejection based on Hanawa, Cornforth and Pehrsson should be overturned.

Claims 13, 15-17 and 22, 24 and 25

Claim 13, from which Claims 15-17 depend, and Claim 22, from which Claims 24 and 25 depend, were rejected for allegedly being unpatentable under 35 U.S.C. 103(a) over Hanawa in view of Cornforth, and further in view of Pehrsson.

Claim 13 is directed to a system that includes a radio modem unit including a first DC offset circuit which comprises one of a pull-up or a pull-down circuit, and an RF signal booster unit including a second DC offset circuit which comprises the other of a pull-up or pull-down circuit. The booster unit is connectable to the radio modem unit with a single coaxial connection

line adapted to transmit RF signals and a DC offset indicative of the presence of the booster unit based on an interaction between the first and second DC offset circuits. Claim 22 is directed to a method utilizing the above features.

As discussed above, the use of a single connection line for transmission of both an RF signal and a DC offset indicative of the presence of a booster unit is not disclosed or suggested by Hanawa or Cornforth. Perhsson, which shows a pull-up (108) and a pull-down (110) circuit, disposes these on the same side of an interface circuit, so that even if Perhsson is properly combinable with Hanawa and Cornforth, the invention as set forth in Claim 13 would not result.

Claims 19 and 21

Claim 19, from which Claim 21 depends, was rejected for allegedly being unpatentable under 35 U.S.C. 103(a) over Barber in view of Hanawa and further in view Perhsson.

The above arguments extend to Claim 19 as well, which is directed to an RF signal booster unit adapted to amplify RF signals from a radio modem including a first DC offset circuit which comprises one of a pull-up or a pull-down circuit and a second DC offset circuit which comprises the other of the pull-up or pull-down circuits. The booster unit also includes a switch that significantly attenuates the RF energy from the radio modem that is provided to a power amplifier in the booster unit by way of a single connection line adapted to further carry a DC offset indicative, based on an interaction between the first and second DC offset circuits, of the presence of the booster unit until a valid power control message is received from the radio modem. The switch includes a pair of diodes arranged back-to-back and disposed in the RF signal path, such that when the switch is in an ON position RF signals pass through the diodes from the radio modem to the booster unit, and when the switch is in an OFF position, RF signals are precluded by the diodes from effectively passing from the radio modem to the booster unit.

As discussed above, the use of a single connection line for transmission of both an RF signal and a DC offset indicative of the presence of a booster unit is not disclosed or suggested by Barber, Hanawa or Pehrsson, even if these references were properly combinable. Further, the claimed diode arrangement is markedly different from that of Barber, wherein diodes 234 and 236 are NOT connected end-to-end, and do not provide an RF signal flow path when the switch is ON. They are connected head-to-head as part of a complex arrangement involving CPU 209 (FIG. 9), and are designed to effect switching between two booster units (192 and 194) depending on the desired transmission mode. In the presently claimed invention, a simple ON/OFF switching mechanism is employed to protect the power amplifier in the booster unit in a much more elegant and efficient manner, with the RF signals flowing through the diodes in the ON mode, and being effectively blocked, or reflected back to the radio modem, in the OFF mode.

Claims Appendix

1. A system comprising:

a radio modem unit;

an RF signal booster unit connectable to the radio modem unit through a single connection line by way of which radio communication between the radio modem unit and RF signal booster occurs; and

auto-detect logic configured to detect a DC offset on said single connection line, said DC offset being indicative of a connection of the radio modem unit to the RF signal booster unit.

3. The system of Claim 1, wherein the auto-detect logic is located within the radio modem unit.

4. The system of Claim 1, wherein the auto-detect logic includes an inductor to allow the DC offset to be placed onto the single connection line and to prevent radio frequency energy from passing into the auto-detect logic.

5. The system of Claim 1, wherein the booster unit includes an element to reduce the DC power level to low if the radio modem unit is connected to the booster unit.

6. The system of Claim 5, wherein the element in the booster unit includes an inductor.

7. The system of Claim l, wherein the voltage on the single connection line is high if no booster unit is connected but is low if a booster unit is connected.

8. A radio modem unit comprising:

a radio including a first DC offset circuit which comprises one of a pull-up or a pull-down circuit;

an RF signal connector operably connected to the radio, the connector being connectable to a RF antenna or a booster unit and including a single connection line adapted to carry an RF signal and a DC offset; and

a detector unit adapted to detect the DC offset to determine whether the connector is connected to a booster unit based on an interaction between the first DC offset circuit and a second DC offset circuit included in the booster unit and comprising the other of the pull-up or pull-down circuits.

10. The radio modem unit of Claim 8, wherein the DC offset of the connector is high if no booster unit is connected but is low if a booster unit is connected.

11. The radio modem unit of Claim 8, wherein an inductor is used as part of the detector unit.

12. The radio modem unit of Claim 8, wherein the radio modem unit is connected to a booster unit, the booster unit including a circuit to pull the DC offset at the connector to low.

13. A system comprising:

a radio modem unit including a first DC offset circuit which comprises one of a pull-up or a pull-down circuit; and

an RF signal booster unit including a second DC offset circuit which comprises the other of the pull-up or pull-down circuits, wherein the booster unit is connectable to the radio modem unit with a single coaxial connection line adapted to transmit RF signals and a DC offset indicative of the presence of the booster unit based on an interaction between the first and second DC offset circuits, and wherein baseband signals are transmitted to the RF signal booster unit by way of the single coaxial connection line by the radio modem and are used by the booster unit to prepare for transmission.

15. The system of Claim 13, wherein the baseband signals are power control signals.

16. The system of Claim 15, wherein the power control signals are used to control power and channel selection.

17. The system of Claim 13, wherein the RF signal booster unit includes a switch that prevents RF energy from being provided to a power amplifier in the booster unit until a valid power controller message is received from the radio modem.

19. An RF signal booster unit adapted to amplify RF signals from a radio modem including a first DC offset circuit which comprises one of a pull-up or a pull-down circuit, the booster unit including a second DC offset circuit which comprises the other of the pull-up or pull-down circuits, and further including a switch that significantly attenuates the RF energy from the radio modem that is provided to a power amplifier in the booster unit by way of a single connection line adapted to further carry a DC offset indicative, based on an interaction between the first and second DC offset circuits, of the presence of the booster unit until a valid power control message is received from the radio modem, the switch comprising a pair of diodes arranged back-to-back and disposed in the RF signal path, such that when the switch is in an ON position RF signals pass through the diodes from the radio modem to the booster unit, and when the switch is in an OFF position, RF signals are precluded by the diodes from effectively passing from the radio modem to the booster unit.

21. The system of Claim 19, wherein when the switch is in the ON position, current flows through the diodes and the RF impedance of the switch is reduced, but when the switch is in the OFF position, current is not flowing through the diodes, and the RF impedance of the switch is high.

22. Method of using a radio modem unit and an RF signal booster unit, the booster unit and radio modem unit connectable using a connector establishing a connection line, the method comprising:

in the radio modem unit, detecting a DC offset on the connection line to determine whether the booster unit is connected based on an interaction between a first DC offset circuit in the radio modem including one of a pull-up or a pull-down circuit

and a second DC offset circuit in the booster unit including the other of the pull-up or pull-down circuits;

if the booster unit is connected, transmitting baseband signals on the connection line from the radio modem to the booster unit to allow the booster unit to prepare for transmission; and

thereafter, transmitting an RF signal on the connection line from the radio modem to the booster unit.

24. The method of Claim 22, wherein the baseband signal is the power control signal.

25. The method of Claim 24, wherein the power control signal includes a channel control and power level indications.

Evidence Appendix

None.

Related Proceedings Appendix

None.

Please charge any additional required fee or credit any overpayment not otherwise paid or credited to our deposit account No. 50-1698.

Respectfully submitted,
THELEN REID BROWN RAYSMAN & STEINER, LLP

Dated: 02/20/2007

Khaled Shami
Reg. No. 38,745

THELEN REID BROWN RAYSMAN & STEINER, LLP
P.O. Box 640640
San Jose, CA 95164-0640
Tel. (408) 292-5800
Fax. (408) 287-8040